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Wiring ISDN Service to a Single Target Room

Introduction

This pamphlet describes, in simple tasks, how to wire ISDN Service to a single target room in residential and small business environments. The method described here for wiring ISDN to a single target room uses an unused pair of wires within the existing telephone wiring.

Other wiring methods are possible and are discussed in NIUF document 433R1-94 entitled "ISDN Wiring and Powering Guidelines (Residence and Small Business)." Also, that publication will aid in the clarification of any concepts discussed within this pamphlet.

Caution: Before beginning the installation process, please review the Important Safety information found at the end of this pamphlet.

In-House Wiring Assessment

ISDN service, as a second line application, can use a spare pair of conductors from the in-house wiring. The term in-house wiring is a generic term used to describe the wiring between telephone jacks and the connection to the telephone network. This point of connection is termed the Demarcation Point (Demarc) and represents the interface between the service provider's network and the customer's in-house wiring (see Figure A).

TASK - Find a spare pair of conductors at the Demarc. In order to locate a spare pair of conductors, the installer must first locate the Demarc within the residence. The Demarc is normally found close to the point where the service provider's drop wire enters the residence. Typically, the sheath of the in-house wiring is gray, beige or white in color, and has several color coded pairs of wires within its sheath. It normally has two pairs minimally, and can have more (e.g., 4-6 pairs). Once the in-house wiring is located at the Demarc, determine if there is an available (unconnected to the Demarc) pair of wires within the in-house wiring.

Make note of the color coding of the pair and proceed to the section entitled "Wiring from the Demarc to a Single Target Room."

For those installations converting a second POTS line to ISDN service, the installer need only rewire to a standard ISDN jack. The installer should follow the steps in the next section, being mindful that the term "unused pair" references this second POTS line pair.

If there are no spare pairs available, new wiring must be installed.

Wiring from the Demarc to a Single Target Room

There are restrictions placed upon both the service provider and the customer relating to the location of and the wiring to the Demarc. The Demarc is located within 12 inches of the service provider owned protector block and only Telco personnel are allowed to wire directly to the protector block.

In installations using dual-line POTS, there are many possible jack configurations that can be used (e.g., single, dual, etc.). Make sure that all pairs are connected correctly.

TASK - Find a spare pair in the desired room location. Uncover the desired jack and verify that the same spare pair found earlier at the Demarc is located at this jack. If you are unable to find a spare pair between the Demarc and the jack, then additional in-house wiring must be installed, unless a working pair can be freed up.

TASK - Wire the spare pair to the ISDN jack. The spare pair must be wired to a standard ISDN U Interface jack. ISDN jacks are physically different from the modular jacks used for POTS. POTS jacks provide either 4 or 6 conductors, and use the center 2 pins for service. ISDN jacks use an 8 pin modular jack and the center two pins are used for connection to the network.

For safety, first disconnect all of the in-house wiring connections at the Demarc. The connections to the Demarc can take on different forms, from screw terminals to modular connections. If your Demarc device uses screw terminals, take care in noting which wire (or set of wires) goes to which screw terminal. This is very important, since reversing these connections may affect service on the POTS line(s).

Connect the ISDN pair to the center two wires of the 8 pin jack. The actual method of connection is dependent upon the manufacturer of the jack; review the instructions provided with your jack.

Attach the cover of the jack and label it "ISDN U". Re-connect all of the in-house wiring connections previously removed from the Demarc. POTS should now be restored. Verify that the POTS line works appropriately.

If after you attempt to dial on the POTS line, you still hear dial tone, the in-house wiring connections to the Demarc need to be reversed. After reversing, re-test as described above.

TASK - Connect the ISDN Pair to the Demarc. Make sure that your ISDN service has been connected and activated. Connect the ISDN pair to the user side of the Demarc. The Telco may have identified a connection point for ISDN on the Demarc. The identification will often be a notation of the ISDN number assigned to your ISDN service.

TASK - Connect your ISDN Equipment. You are now ready to option your ISDN equipment. A typical arrangement includes a power supply, an NT1, and an ISDN set with data and/or voice capabilities (some ISDN sets have a built-in NT1).

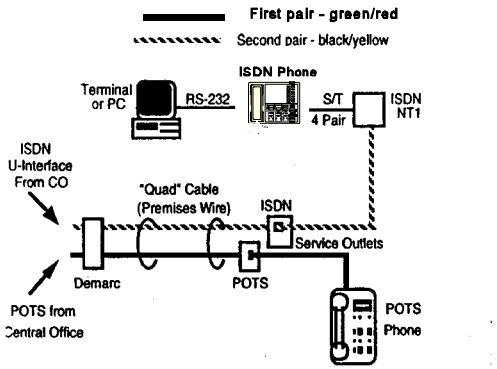

Figure A
ISDN Equipment Connected to ISDN Jack

Proper selection of NT1 timing options and terminating resistors is very important for satisfactory ISDN service. The NT1 should be configured so that it provides a 50 ohm resistance termination. Also, if your NT1 has an option for fixed or adaptive timing, choose the default timing option provided in your NT1. Consult the NT1 instructions for optioning details. Connect the NT1 to Its power supply and to the ISDN line.

Set the terminating resistors in the ISDN set to "off" or "none". Connect the cable between the ISDN set and the NT1. Program the required operating parameters in the ISDN set (such as SPID, Directory Number, etc.) following the manufacturers instructions. Certain parameters (e.g., SPID, DNs) are provided by your service provider. You should now be able to make/receive calls from your ISDN equipment.

If everything is operational, the installation is complete.

TASK- Troubleshooting. If your ISDN service is not working, you may need to troubleshoot your configuration:

- Is everything plugged in as it is supposed to be?

- Do status indicators on your ISDN equipment appear OK?

- Is your ISDN set programmed with a SPID(s) and other required parameters?

- Are the terminating resistors optioned correctly in the NT1 (50 ohms) and the ISDN set (off or none)?

- Does your ISDN equipment pass its own self test?

- Is the problem eliminated if you connect your ISDN equipment (NT1 plus ISDN set) directly into the Demarc? If it is, recheck your in-house wiring.

Cautionary Notes

* DO NOT WORK ON YOUR TELEPHONE WIRING AT ALL IF YOU WEAR A PACEMAKER. Telephone lines carry electrical current.

* Never install telephone wiring during a lightning storm.

* Never install telephone jacks in wet locations unless the jack is specifically designed for this purpose.

* Use caution when installing or modifying telephone lines.

* Use a screwdriver and other tools with insulated handles.

* You and those around you should wear safety glasses or goggles.

* Be sure that your in-house wiring is not connected to the Demarc while you are working on your telephone wiring.

* Do not place telephone wiring or connections in any conduit, outlet or junction box containing electrical wiring.

* Installation of in-house wire may bring you close to electrical wire, conduit, terminals and other electrical facilities.

EXTREME CAUTION must be used to avoid electrical shock from such facilities. You must avoid contact with all such facilities.

* Telephone wire must be at least 6 feet from bare power wiring or lightning rods and associated wires, and at least 6 inches from other wire (antenna wires, doorbell wires, wires from transformers to neon signs), steam or hot water pipes, and heating ducts.

* Before working with existing inside wiring, check all electrical outlets for a square telephone dial light transformer and unplug it from the electrical outlet. Failure to unplug all telephone transformers can cause electrical shock.

* Do not place a jack where it would allow a person to use the telephone while in a bathtub, shower, swimming pool, or similar hazardous location.

* Protectors and grounding wire placed by the service provider must not be connected to, removed, or modified by the customer.

* Check local building codes for safety guidelines.

* Be careful not to deform the wire by crimping, knots, sharp corners, etc.